Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Currently Amended) ~~The method according to claim 11,~~ A method for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the method comprising:

breaking the N bits of a check vector in the register into M parts, wherein N and M are integers and $1 < M < N$; and

selecting an available part that has a free bit;

wherein the available part is a first part, having a free bit, to the left of the part pointed to by the current pointer; and

wherein the step for selecting the available part comprises:

breaking the current pointer into upper bits and lower bits, wherein the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have X-Y bits and a value L, and wherein $0 \leq U \leq 2^Y-1$, and $0 \leq L \leq 2^{X-Y}-1$, where all of X, Y, U, and L are integers;

creating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts;

obtaining an add vector by setting its bit number U;

adding the add vector to the check sector to obtain a sum; and

multiplying the sum with an inverse of the check sector.

13.   (Cancelled)

14.   (Currently Amended) ~~The method according to claim 13,~~ A method for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the method comprising:

breaking the N bits of a check vector in the register into M parts, wherein N and M are integers and 1< M<N; and

selecting an available part that has a free bit;

wherein the available part is a first part, having a free bit, to the left of the part pointed to by the current pointer;

the method further comprising finding a free bit in the available part; and

wherein the step for finding ~~an empty~~ a free bit comprises:

increasing the available part by 1; and

multiplying the increased available part with an inverse of the available part.

15.   (Cancelled)

16.   (Cancelled)

17.   (Cancelled)

18.   (Cancelled)

19.   (Currently Amended) ~~The method according to claim 7, further~~ A method for
finding a next free bit in a register having N bits and a current pointer pointing to one of the bits,
the method comprising:

breaking the N bits of a check vector in the register into M parts, wherein N and M are
integers and 1< M<N;

selecting an available part that has a free bit;

creating a check sector, wherein each bit of the check sector results from performing an
AND operation to all bits of a corresponding part of the M parts; and

deciding whether the register has a free bit by performing an AND operation to all bits of
the check sector.

20.   (Cancelled)

21.   (Cancelled)

22.   (Cancelled)

23.   (Cancelled)

24.   (Cancelled)

Atty. Docket No. MP0267 (13298/11)
PATENT APPLICATION

Application No. 10/678,523
Amendment Under 37 C.F.R. §1.116 dated April 30, 2009
Final Office Action mail date: January 7, 2009

25.   (Currently Amended)   ~~The apparatus according to claim 24,~~ An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and $1 < M \leq N$; and

a selector for selecting an available part that has a free bit, wherein the selector selects the available part on the left of the part pointed to by the current pointer;

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and $1 < M \leq N$; and

a check sector generator for generating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts; and

a second breaker for breaking the current pointer into upper bits and lower bits, wherein the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have X-Y bits and a value L, and wherein $0 \leq U \leq 2^Y - 1$, and $0 \leq L \leq 2^{X-Y} - 1$, where all of X, Y, U, and L are integers;

wherein the selector comprises:

an add vector generator, setting bit number U of the add vector;

an adder for adding the add vector to the check sector to obtain a sum; and

a multiplier for multiplying the sum with an inverse of the check sector.

26.   (Cancelled)

27.   (Cancelled)

28.   (Cancelled)

29.   (Cancelled)

30.   (Cancelled)

31.   (Cancelled)

32.   (Currently Amended) ~~The apparatus according to claim 31,~~ An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and $1 < M < N$;

a selector for selecting an available part that has a free bit;

a second breaker for breaking the current pointer into upper bits and lower bits, wherein the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have X-Y bits and a value L, and wherein $0 \leq U \leq 2^Y - 1$, and $0 \leq L \leq 2^{X-Y} - 1$, where all of X, Y, U, and L are integers; and

a free bit finder, wherein the free bit finder finds a free bit on the left of the bit pointed to by the current pointer;

wherein the ~~empty~~ free bit finder comprises:

an add vector generator, setting bit number L of the add vector;

an adder for adding the add vector to the available part to obtain a sum; and

a multiplier for multiplying the sum with an inverse of the available part.

33.   (Cancelled).

SJ01 137686 v1

34.   (Currently Amended) ~~The apparatus according to claim 33,~~ An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and 1< M<N;

a selector for selecting an available part that has a free bit; and

a free bit finder, wherein the free bit finder finds a free bit from the beginning of the available part;

wherein the ~~empty~~ free bit finder comprises:

an adder for increasing the available part by 1; and

a multiplier for multiplying the increased available part with an inverse of the available part.

35.   (Currently Amended) ~~The apparatus according to claim 20, further comprising:~~ An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

a first breaker for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and 1< M<N;

a selector for selecting an available part that has a free bit;

a check sector generator for generating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts; and

a register status unit for performing an AND operation to all bits of the check sector.

36.   (Currently Amended) The apparatus according to claim [[20]] 35, further comprising:

a next vector generator for generating the next vector with the found empty free bit masked.

37.   (Cancelled)

38.   (Cancelled)

39.   (Currently Amended) The apparatus according to claim [[37]] 49, wherein the selecting means selects the available part on the left of the part pointed to by the current pointer.

40.   (Currently Amended) The apparatus according to claim [[39]] 51, further comprising:

means for generating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts.

41.   (Cancelled)

42.   (Cancelled)

43.   (Cancelled)

44.   (Cancelled)

45.   (Cancelled)

46.   (Cancelled)

47.   (Cancelled)

48.   (Cancelled)

SJ01 137686 v1

Atty. Docket No. MP0267 (13298/11)
PATENT APPLICATION

Application No. 10/678,523
Amendment Under 37 C.F.R. §1.116 dated April 30, 2009
Final Office Action mail date: January 7, 2009

49.   (Currently Amended) ~~The apparatus according to claim 48,~~ An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

means for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and 1< M<N; and

means for selecting an available part that has a free bit;

a second means for breaking the current pointer into upper bits and lower bits, wherein the current pointer has X bits, the upper bits have Y bits and a value U, and the lower bits have X-Y bits and a value L, and wherein $0 \leq U \leq 2^{Y}-1$, and $0 \leq L \leq 2^{X-Y}-1$, where all of X, Y, U, and L are integers; and

means for finding the free bit, wherein the free bit finding means finds the free bit on the left of the bit pointed to by the current pointer;

wherein the ~~empty~~ free bit finding means comprises:

means for generating an add vector, setting bit number L of the add vector;

means for adding the add vector to the available part to obtain a sum; and

means for multiplying the sum with an inverse of the available part.

50.   (Cancelled)

51.   (Currently Amended) ~~The apparatus according to claim 50,~~ An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

means for breaking the N bits of the check vector in the register into M parts, wherein N

Atty. Docket No. MP0267 (13298/11)
PATENT APPLICATION

Application No. 10/678,523
Amendment Under 37 C.F.R. §1.116 dated April 30, 2009
Final Office Action mail date: January 7, 2009

and M are integers and 1< M<N; and

means for selecting an available part that has a free bit; and

means for finding the free bit, wherein the free bit finding means finds the free bit from the beginning of the available part;

wherein the ~~empty~~ free bit finding means comprises:

means for increasing the available part by 1; and

means for multiplying the increased available part with an inverse of the available part.

52.   (Currently Amended)   ~~The apparatus according to claim 37, further~~ An apparatus for finding a next free bit in a register having N bits and a current pointer pointing to one of the bits, the apparatus comprising:

means for breaking the N bits of the check vector in the register into M parts, wherein N and M are integers and 1< M<N;

means for selecting an available part that has a free bit;

means for generating a check sector, wherein each bit of the check sector results from performing an AND operation to all bits of a corresponding part of the M parts; and

means for performing an AND operation to all bits of the check sector.

53.   (Currently Amended)   The apparatus according to claim ~~37~~ 52, further comprising:

means for generating the next vector with the found free bit masked.

54.   (Cancelled)

55.   (Cancelled)

56.   (Cancelled)

57.   (Cancelled)

58.   (Cancelled)

59.   (Cancelled)

60.   (Cancelled)

61.   (Cancelled)

62.   (Cancelled)

63.   (Cancelled)

64.   (Cancelled)

65.   (Cancelled)

66.   (Cancelled)

67.   (Cancelled)

68.   (Cancelled)

69.   (Cancelled)

70.   (Cancelled)

71.   (Cancelled)

72.   (Cancelled)

73.   (Cancelled)

74.   (Cancelled)

75.   (Cancelled)

76.   (Cancelled)

77.   (Cancelled)

SJ01 137686 v1

Atty. Docket No. MP0267 (13298/11)
PATENT APPLICATION

Application No. 10/678,523
Amendment Under 37 C.F.R. §1.116 dated April 30, 2009
Final Office Action mail date: January 7, 2009

78.   (Cancelled)

79.   (Cancelled)

80.   (Cancelled)

81.   (Cancelled)

82.   (Cancelled)

83.   (Cancelled)

84.   (Cancelled)

85.   (Cancelled)

86.   (Cancelled)

87.   (Cancelled)

88.   (Cancelled)

89.   (Cancelled)

90.   (Cancelled)

91.   (Cancelled)

92.   (Cancelled)

93.   (Cancelled)

94.   (Cancelled)

95.   (Cancelled)

96.   (Cancelled)